

Summary of the Invention

As noted in Applicant's earlier response, the claims of the invention are generally directed to an electro-optical device and a method for driving the same in which a clear, gradated display is achieved by using a plurality of pulses to drive a pixel element. This allows the frame frequency to remain at a level that does not cause undesirable flicker effects while still achieving a gradated display.

Prior Art Rejections

The Official Action continues to reject claims 21-32 and 36 under 35 U.S.C. § 102(b) as anticipated by U.S. Patent 4,743,096 to Wakai et al. The Official Action substantially repeats the rejection from the first Office Action (Paper No. 5) with respect to these claims. In response to Applicant's earlier arguments that Wakai et al. fails to show a plurality of pulses, the Examiner disagrees, stating that Wakai et al. does teach a data signal comprising a plurality of pulses and refers to Figures 5, 8 and 10a-10c.

In response to Applicant's argument that Wakai et al. in fact shows a single, continuous pulse, the Examiner agrees, but states: "The data signal is a continuous pulse when the signal is considered as a whole. However, the continuous pulse consists of a plurality of pulses (see figures 5, 8 and 10a-10c)." With reference to Fig. 8 and 10a to 10c of Wakai et al., it is noted that a single pulse selected from 16 different kinds of single pulses shown in Fig. 8 is supplied during the selected period T as the single data signal in Fig. 10b. This is because only one memory set (i.e. data corresponding to M0-M3 in Figure 8) selected from the 16 different memory sets shown in Figure 8 is used for the data signal in Fig. 10b

during the selected period T. Thus, the data signal comprises a single pulse in the embodiment Figs. 8 and 10a to 10c of Wakai.

It appears that the Official Action may be incorrectly asserting that since Wakai et al. discloses that a single pulse is periodically applied to the display during successive scan periods, this results in a "plurality of pulses" being applied to the display and therefore anticipates the present invention. However, independent claims 21 and 26 clearly recite that the data signal comprising a plurality of pulses is applied to the pixels during the scan period, and therefore it is asserted that this recitation precludes such an interpretation of the claims. Referring to Figure 9, and column 5, lines 17-27 and 37-40, Wakai et al. states: "In a selected period, as has been shown in FIG. 9, the voltage  $V_{LC}$  is applied to the liquid crystal layer during the pulse-width modulation signal." However, as can clearly be seen in Figure 9 of Wakai et al., the driving pulse (represented by  $t_{ON}$ ) is a single pulse. Therefore, since Wakai et al. appears to fail to disclose or suggest the application of a plurality of driving pulses during a single scan period, Applicant does not feel that the claims of the present invention are anticipated by Wakai et al. and reconsideration is requested.

Furthermore, the claims of the present invention clearly recite that the data signal containing the plurality of pulses is supplied to each of the pixels. Therefore, even if "the continuous pulse consists of a plurality of pulses" as asserted by the Official Action, it is respectfully asserted that this plurality of pulses is not supplied to each of the pixels in Wakai et al. and therefore, for this further reason, Wakai et al. does not anticipate the claims as now written.

With respect Figs. 4 to 6 in Wakai et al., it is noted that the driving method of the prior art Figs. 4 to 6 implements selection by time (see

column 1, line 58 of Wakai, "selected period" is used in the prior art) and does not use both a data signal and a scan signal for selection. Contrary to this, the present invention (see e.g. claim 21) uses both of the data signal and the scan signal for selection. The present invention is distinguished from prior art Fig. 4 to 6 of Wakai et al. in this respect. Therefore, for this additional reason, claims 21-32 and 26 are not anticipated by Wakai et al. and reconsideration of the pending rejection is requested for this further reason.

The Official Action also continues to reject claims 33-35 as obvious based on the combination of Wakai et al. and U.S. Patent No. 4,897,639 to Kanayama and to reject claim 37 as obvious based on the combination of Wakai et al. and U.S. Patent 4,021,607 to Amano. The Official Action further rejects claim 34 for the first time as obvious based on the combination of Wakai et al. and U.S. Patent 5,142,272 to Kondo, and rejects claims 38-40 as obvious based on the combination of Wakai et al. and U.S. Patent 4,973,135 to Okada et al. Applicant notes, however, that Kanayama, Amano, Kondo and Okada do nothing to overcome the deficiencies noted above with respect to Wakai et al. and therefore reconsideration of the rejection to these claims is requested in view of the above comments.

#### Formalities

The Official Action rejects claims 38-40 as failing to be adequately described in the specification. Specifically, the Official Action asserts that the recitation "wherein said thin film transistor has the other one of its source or drain addressed with said scan signal, and a gate supplied with said data signal" is unclear since data signals should be supplied to the

source or drain and scan signals should be supplied to the gate according to figure 25 and page 36, lines 15-23 of the specification.

It is noted, however, that Figure 34 of the present application shows a device in which the data signals are supplied to the gate of the pixel transistor and the scan signals are supplied to the source or drain. Accordingly, it is respectfully asserted that sufficient support exists in the present specification for claims 38-40 and reconsideration in view of Figure 34 is requested.

Conclusion

For all of the above reasons, it is respectfully asserted that claims 21-40 are now in proper condition for allowance and reconsideration of the pending rejections in view of the above comments is requested. If the Examiner feels that any further discussions would advance the prosecution of this case, it is respectfully requested that the undersigned be contacted.

Respectfully submitted,

  
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